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Abstract

The ethics of human enhancement has been a hotly debated topic in the last 15 years. In this debate, some advocate examining science fiction stories to elucidate the ethical issues regarding the current phenomenon of human enhancement. Stories from science fiction seem well suited to analyze biomedical advances, providing some possible case studies. Of particular interest is the work of screenwriter Andrew Niccol (*Gattaca, S1m0ne, In Time*, and *Good Kill)*, which often focuses on ethical questions raised by the use of new technologies. Examining the movie *In Time* (2011), the aim of this paper is to show how science fiction can contribute to the ethical debate of human enhancement. *In Time* provides an interesting case study to explore what could be some of the consequences of radical life-extension technologies. In this paper, we will show how arguments regarding radical life-extension portrayed in this particular movie differ from what is found in the scientific literature. We will see how *In Time* gives flesh to arguments defending or rejecting radical life-extension. It articulates feelings of unease, alienation and boredom associated with this possibility. Finally, this article will conclude that science fiction movies in general, and *In Time* in particular, are a valuable resource for a broad and comprehensive debate about our coming future.

Keywords

Human enhancement Life-extending therapy Immortality Ethics Aging

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> "We can all live forever as long as we don't do anything foolish. Doesn't that scare you? That maybe you'll never do anything foolish or courageous or anything worth a damn."
>
> - Sylvia Weis, *In Time* (2011)

Introduction

The ethics of human enhancement has been a hotly debated topic in the last 15 years. Medical technologies that were traditionally used for therapeutic purposes can now be used to make us 'better than well' (Elliott 2004). Some authors, however, question whether human enhancements might cause or exacerbate injustice (Buchanan et al. 2001; Habermas 2003; Harris 2008), unforeseen risks (Annas et al. 2002; Fukuyama 2003; Glannon 2002a, b; McKibben 2004; Sandel 2007) and might threaten the traditional concept of medicine, (Eichinger 2013) our autonomy (DeGrazia 2005; Harris 2008; Schaefer et al. 2014), our authenticity (Elliott 2004; Erler 2012; Levy 2011; Parens 2005; Svenaeus 2009) and even our very human nature (Fenton 2006; Habermas 2003; Kamm 2005; Roduit et al. 2015; McConnell 2010).

For some, bioethics provides some tools in the form of bioethical principles to help us understand and analyse the ethical challenges of human enhancement (Childress and Beauchamp 2008). In general, if a medical intervention does not pose problems for the principles of justice, nonmaleficence, beneficence and autonomy, the intervention can be conceived of as morally unproblematic. However, even if a given enhancement would be considered unproblematic in regards to these principles, it could still lead to some worry. These worries are often illustrated in the work of fiction, like Aldous Huxley's *Brave New World*(Huxley 1932/2006). In this novel, the drug Soma is used as an enhancer, satisfying the moral requirements of safety, justice, beneficence and autonomy. But arguments that defend Soma as morally acceptable are yet to be found (Roduit 2016). Some have therefore argued that bioethical principles are sometimes limited for ethical inquiries regarding human enhancement (Roduit et al. 2013, 2014).

Some authors advocate using science fiction in ethical analyses of the current phenomenon of human enhancement (Agar 2010; Eichinger 2011). Others "have gone so far as to claim that films not only contain interesting philosophical references but also can actually philosophize" (Shapshay 2009). Looking to science fiction to motivate this analysis seems therefore to be a promising enterprise, as the stories told seem often well suited to analyze biomedical advances.[1] Although they do not reflect reality, these stories can help us to explore the possible ethical implications of enhancement (Shapshay 2009). Screenwriter Andrew Niccol has been particularly interested in issues regarding ethical questions raised by new technologies with movies such as *Gattaca, The Truman Show, S1m0ne, In Time*, and *Good Kill*.

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The aim of this paper is to look at how fiction can contribute to the ethical debate of human enhancement.[2] We will focus on the movie *In Time* (Niccol 2011). *In Time* gives us an interesting case study to look at what could be some of the consequences of radical life-extension technologies. We will explore how this movie can inform the debate on human enhancement.

We will compare Niccol's doubts and concerns to both the critique of radical enhancement put forward by Nicholas Agar (Agar 2010, 2014) and the defense of radical life-extension of John Harris (Harris 2008) and Aubrey de Grey. Because the movie addresses questions about radical life extension, we will not be concerned with the debate on moderate life extension. We will see that *In Time* does not necessarily bring new arguments against radical life-extension that have not appeared elsewhere in the debate. It does, however, use some arguments from the debate in different ways. Most importantly, it illustrates arguments that are sometimes complicated speculations regarding radical life-extension. It articulates feelings of unease, alienation and boredom associated with this possibility. Therefore science fiction movies in general, and *In Time* in particular, can be a valuable resource for a broad and comprehensive debate about our coming futures. This movie is a good example of how stories in film can stimulate and enhance philosophical and bioethical reflection. It serves as a theoretical laboratory where ethical experiments can be conducted, with specific case studies. This is extremely valuable, particularly for the debate of radical life extension, because we do not have real life scenarios to analyze.

Synopsis of 'In Time'

In Time is a futuristic dystopian science fiction movie. The year is 2169. Humans have been genetically modified to stop ageing at the age of twenty-five. However, after their twenty-fifth birthdays, their 'internal clock' is set so that they only have one more year to live. People can live longer only if they have access to more time, in the same way we would acquire money. The wealthy can live thousands of years, while the poor have to struggle on a daily basis to buy or steal time. Time has become the currency and can be used to buy goods. A cup of coffee can vary between the costs of 3–4 min. Time can be exchanged, earned, or stolen between individuals through their 'time clock' that has been genetically engineered and is being illustrated by a fluorescing green light implanted into the wrist. If someone runs out of time, she dies.

The film is set in two different geographical locations, or 'time zones'. Dayton is a ghetto where the protagonist Will Sallas (Justin Timberlake) lives with his mother, Rachel (Olivia Wilde) and works in a factory. People of Dayton struggle daily to gain more time and live one more day. Sallas dreams to bring his mother to New Greenwich for her birthday. In New Greenwich, the time zone of the wealthy, people have enough time to live centuries and beyond.

At the beginning of the movie, Sallas encounters Henry Hamilton, a centenarian from New Greenwich who has come to Dayton to waste all of his time away. Because of boredom, life itself had become not worth living anymore for him. Nonetheless, Sallas saves his life from the so-called 'Minutemen', a group of thieves, whose goal is to steal time from people. After being rescued, Hamilton reveals the truth to Sallas that in New Greenwich there is enough time for everyone. And, as a token of appreciation, Hamilton transfers all of his time but 5 min to Sallas, while Sallas is asleep. For the last 5 min of his life, Hamilton quietly awaits his death on a bridge. Once his clock stops, he falls off the bridge and dies.

Having now inherited more than a century, and having been informed that there is enough time for everyone, Sallas decides to visit New Greenwich, with the aim to take the time from the wealthy to redistribute it to the less fortunate. The Police, or the "Timekeepers", investigate Hamilton's death, believing that Sallas might be the murderer. The rest of the movie describes the Timekeepers trying to catch Sallas. After giving a working definition of radical enhancement, we will use different examples in the following sections to illustrate different objections portrayed in the movie against some of the consequences radical life-extension could have.

Objections against radical life-extension

Agar has introduced the notion of "radical enhancement" in the debate on the ethics of human enhancement. For him, radical enhancement "involves improving significant human attributes and abilities to levels that greatly exceed what is currently possible for human beings" (Agar 2010). While he admits giving a vague definition, radical enhancement could also be interpreted as an enhancement of a degree so great that it would transform humans into something other than humans.

Radical life-extension can be interpreted as one sort of possible radical enhancement. The strategies Aubrey de Grey is proposing, whose goal is to stop and even reverse ageing, is called 'strategies for engineered negligible senescence' (SENS) (de Grey and Rae 2008). For Agar, this is a good example of what he calls radical enhancement. *In Time* describes a world in which radical life-extension has become a reality. Some might question why we should take de Grey's vision and the view portrayed in a science fiction movie seriously for an ethical investigation. Agar responds to this criticism. For him,

> "de Grey has said enough about how we might put an end to aging to be taken seriously. The reach of SENS clearly exceeds the grasp of early twenty-first century medical science. It belongs in the same category as putting human colonies on Mars and cloning woolly mammoths—things that we might be able to do eventually if we try hard enough." (Agar 2010)

De Grey offers therefore a sort of a blueprint that could guide future life-extension research. It is outside the scope of the investigation here as to whether this is 'biologically feasible' now or in the near future. Instead, we will treat it here as a visionary project that has given enough evidence to be taken seriously. For an ethical analysis, the goals and visions behind the project of radical-life extension are far more interesting here, even if it is not yet scientifically evident. A comprehensive assessment of the broad range of possible ethical arguments for and against life extension is relevant and differentiated enough without considering that more "technical" question or obstacle. Therefore, for the sake of argument, we will consider that radical life-extension would be a safe procedure,[3] as illustrated in *In Time*. In the movie, there are no apparent direct harms regarding the fact that humans stop ageing at the age of twenty-five. However, other objections against radical life-extension are raised in the movie.

Justice

In Time's main focus concerns itself with ethical issues of distributive justice. The protagonist, Will Sallas, is some sort of futuristic Robin Hood taking time from the rich to redistribute to the poor. Sallas justifies his action by claiming that it is not stealing, because

the rich already stole it from the poor. For him, the real thieves are the wealthy that refuse to share their fortune with the underprivileged. In this sense, at first glance, *In Time* is a critique of the financial system and problems of global and distributive justice. It shows the struggle between the poor and the rich, as well as the almost impossibility for the poor to change their condition. The wealthy have the ability to simply raise prices. As illustrated in the movie, they can change the price of coffee from 3 to 4 min, without any warning and/or apparent reason. In turn, this will then increase the number of deaths in poor neighborhoods. Additionally, to cross from one time zone to the other, one must pay hours, weeks and even months to do so. Thus, this is impossible for the poor. For Will this is unacceptable. He admits that "it's nobody's fault what they are born with" (Niccol 2011). He fights the idea that the wealthy keep everything to themselves, as it seems there would be plenty of life-years for all.

At first glance, the main ethical problem seems not to be with life-extension (radical enhancement) per se, but with how the resources are distributed. The protagonist is more than happy to redistribute time from the rich to the poor, with the goal of eventually making everyone live longer. Will could not understand why Hamilton would be bored of having the possibility to live on for centuries. Hamilton, who is indeed bored because he has been alive too long, mentions, "We want to die. We need to" (Niccol 2011). Will is shocked by what seems to be a non-problem. "That's your problem? You've been alive too long!" (Niccol 2011).

This reflects some attitudes that can also be found in the debate on radical life-extension. Some have tried to argue that radical life-extension would be morally problematic because of problems of justice. Harris, however, refutes this argument. For him, one should not refrain from something good (e.g. radical life-extension) only because not everyone could get it at once (Harris 2008). Moreover, he argues that if enhancing technologies are too expensive and can only be accessed by the rich in the beginning, they will eventually become cheaper and available to all (Harris 2008). Some argue that, to the contrary, such radical enhancement could be used as a mean to decrease injustice between the 'haves' and the 'have-nots', producing 'parallel populations' (Harris 2008) with the extreme result of separating human species of 'mortals' and 'immortals' (Kass 2003).

However, as argued elsewhere (Roduit 2016), the problem here is not with enhancement per se, but with how enhancement will be distributed. It is, therefore, a problem of distributive justice and not directly of human enhancement. In *In Time*, the protagonist is not against life-extension itself, but against the fact that to regulate resources (time), some people have to die, and the fact that the wealthy (who are almost immortals) have forgotten how to live. Their behaviour is strongly determined by their fear of death and is characterized by avoidance rather than action.

Boredom

In one of the first scenes, the centenarian Hamilton explains to Will that "the day comes when you've had enough" (Niccol 2011). This is the main reason why Hamilton wants to end his life. Life has become so boring, because negligibly senescent beings, those who are immune to aging, have become so cautious of not dying that they have forgotten to live.

Harris strongly refutes the claim that activities and experiences will become boring for the negligibly senescent beings. He highly doubts he will get bored (Harris 2002). Indeed, while

some people might get bored, others might not. Even without radical life-extension, some get easily bored, while others will always find meaningful things to do and will sustain their interest in continued life. For Harris, "only the terminally boring are in danger of being terminally bored, and perhaps they do not deserve indefinite life" (Harris 2004).

To resolve this problem, some have defended the idea that individuals could be given the opportunity to live as long as they wish. If they became bored, they could also be given the opportunity to end their lives (Harris 2004). At the end, only people who enjoy being negligibly senescent would remain.

In contrast, Agar argues that boredom could also be the result of a constant fear of taking risk and a constant fear of dying, as illustrated as well in the movie. One of the negligible senescent beings asks, "Do I really want to spend my whole life trying not to die by mistake?" (Niccol 2011).

For Agar, some of the pleasure we have in life comes from the fact that we enjoy taking some sort of risk that moves us out of our zones of comfort (Agar 2010). So, for him, "the fear of death may completely dominate the lives of negligibly senescent people. It will do so to such an extent that it will prevent them from enjoying many of the activities that make our lives pleasurable and meaningful" (Agar 2010). Indeed, some degree of calculated risk can open us to possibilities we would not have considered within these zones. It can make our decisions and actions more significant. Agar's suggestion has been confirmed by an interview given by de Grey in which he mentions that once aging will be cured, people will not even want to take the risks of driving dangerous vehicles. For de Grey "once we cure aging, driving (even on the ground!) will be outlawed as too dangerous for others."[4]

In *In Time*, this fear of risk and of death is illustrated in two notable scenes. Negligibly senescent beings fear both driving and swimming. Having inherited a lot of time, Will decides to buy a very expensive fast car. The salesman mentions to him that included in the price is the set up to display the car. Indeed, driving such a fast car has become too dangerous, but not to Will, who decides to enjoy his new ride. A similar scene illustrates how the negligibly senescent do not swim, because it is also too dangerous in entailing some risk of drowning.

So, the movie illustrates well that "some things that currently seem safe to us will come to seem too dangerous" (Agar 2010). This points to another objection against radical life-extension, namely that changes in values regarding what humans like or don't like might radically transform us. We discuss this later in the paper.

A third objection concerning the argument that radically extended life would be boring has been briefly raised in the movie, but does not seem (to our knowledge) to appear elsewhere in the debate. If you were to stop ageing at the age of twenty-five, you will look twenty-five for the rest of your life. This seems to annoy one of the characters in the movie, who would have preferred to have the opportunity of ageing. At twenty-five, when your clock starts running, you realize "That's what you gonna look like the rest of your life" (Niccol 2011). In the debate, this aspect is on the contrary used to argue *for* life extension and stopping aging. For many proponents, it is one of the most promising effects of anti aging and life extension to stay young and in a youthful bodily condition, including not least a youthful appearance. As an objection, it is not very strong, because we could give the opportunity of radical life-extension only to those who desire it, while letting other people die.

Nonetheless, this objection points to the idea that a movie could be used not only to illustrate ethical argument, but could also bring new aspects to the debate, enriching, therefore, philosophical reflection.

Death gives meaning to life

Another objection against radical life-extension is that death gives meaning to life. Hamilton mentions, "We want to die. We need to" (Niccol 2011). This is echoed later in the movie by Sylvia Weiss, another centenarian, "we are not meant to live like this. We are not meant to live forever. Although I do wonder, father, if you ever lived one day in your life" (Niccol 2011).

In the movie, the timekeeper can't understand why someone who is practically immortal would want to die. Protagonist Will also is shocked to hear such a comment from Hamilton, because for him, this is a non-problem. He says, "That's your problem? You've been alive too long!" (Niccol 2011).

Some argue that only death and finitude gives meaning to life (Williams 1973; Hick 1993), because the limits imposed by a finite lifespan force us to make our decisions and actions count. However, this argument may be missing the point. It is important here to be reminded of the distinction between immortality and life-extension. Becoming a negligibly senescent being does not mean becoming immortal. Death will still be a reality. De Grey explains that "Immortality means inability to die, i.e., a certainty of never dying……[T]here is always a non-zero probability of dying some time—and indeed a non-zero probability of dying in any given year. So … we will never make ourselves immortal" (de Grey cited in Agar 2010). Accidents, diseases and wars can still happen and end many people's lives (Harris 2004). People could also choose to end their lives. Finally, the Universe as we know it will eventually end, making death unavoidable. Even negligibly senescent beings will always be confronted with limits and finitude. This argument regarding death and (sometimes finitude) is not convincing for both proponents and opponents of radical life-extension and enhancement in general, because death will always be present. The main difference is the question of time: when will death arrive? At 5, 25 or 5000 years? While the difference in time is of course significant for the meaning of our choices and actions, the main point here is that finitude and death will remain one way or another.

Overpopulation

Another problem raised both in the enhancement debate and in the movie concerns the limited resources we have on this planet to accommodate everyone. Ecological challenges need to be taken in consideration when choosing radical life-extension. "The combination of people not dying, and being fertile for all but the earliest stages of their lives, could lead to a dramatic increase in population, exceeding the planet's capacity to support us" (Agar 2010). Two solutions have been suggested to address this problem: to regulate the birth rate; or to regulate the death rate. *In Time* illustrates the latter suggested solution.

Regulation by death rate

In the movie, negligibly senescent beings have convinced themselves that "for a few to be immortals, many must die" (Niccol 2011). Death is used as a means to regulate world population and different resources. "Everyone can't live forever, where will we put them?" (Niccol 2011). The world is therefore divided into time zones, according to people's wealth.

Increasing the cost of living by a couple of minutes or hours would generate quite a few deaths in Dayton, while it would not affect New Greenwich at all. This solution, however, raises strong emotional disgust from the protagonist, who has learned from Hamilton that there is more than enough time for everyone. For Will, "no one should be immortal even if only one person has to die" (Niccol 2011).

In the debate, Harris suggests a similar argument saying that society might need to go through some sort of generational cleansing (Harris 2008). "This would involve deciding collectively how long it is reasonable for people to live in each generation and trying to ensure that as many as possible live healthy lives of that length" (Harris 2008). However, it seems highly unlikely that a collective decision on this issue could be made, given the disagreements people would have regarding the details of life-extension.

Regulation by birth rate

De Grey suggests another solution: regulating birth. People who decide to become negligibly senescent beings will have to choose between becoming parents or becoming negligibly senescent. However, some are suspicious that the negligibly senescent would easily choose not to have children (Agar 2010), especially if they were to live at the peak of their biological performance for the rest of their lives. The problem of overpopulation will therefore have to be considered more seriously. Harris offers a possible solution to this problem. Those who decide to radically extend their lives would waive their right to reproduce (Harris 2000).

Intergenerational relationships

Another consequence of radical life-extension illustrated in the movie is that of new challenges with intergenerational relationships. Everyone looks 25 years old. One of the characters introduces his wife, his mother in law and his daughter to Will Salas, explaining how this creates some sort of new confusion, especially in reference to older time, where it was not the case that parents would look as young as their children. The confusion would result from a disruption in the continuity of the natural progression of life stages from childhood to adulthood and old age.

Dehumanization

The last, and perhaps, most important objection against radical life-extension is that it will cause a radical change of value between the negligibly senescent beings and other humans. Negligibly senescent beings would change so much as to become dehumanized. "Many of these pleasures will be different from those that populate human lives" (Agar 2010). The pleasures would be so different that Agar suspects "that few humans would volunteer for the procedure" (Agar 2010). For Agar, becoming a negligibly senescent being is a threat to human experiences that he considers valuable (Agar 2010). Radical life-extension "is likely to alienate us from the things and people who currently give meaning to our lives" (Agar 2010).

In the movie, this is illustrated by showing different behaviours and lifestyles between the wealthy and the poor, between those who can virtually live forever and those who might die tomorrow. These differences reflect a change of values. People from Dayton do everything too fast. In contrast to the wealthy of New Greenwich who do everything slowly, they are always running out of time; they literally run everywhere. But beyond these mere behavior

changes, the movie questions the idea that more life years are better than fewer. It shows how the fear of death and danger can be paralyzing for those who have much longer lives.

More is not better

Both in the debate and in the movie, the idea that more is better is refuted. In the debate, it has been argued that to live (radically) longer (quantitatively) does not imply that the life of an individual will be better (qualitatively). Adding more years does not imply that one would have more opportunities to experience more pleasurable moments (Agar 2010).

In the movie, this is illustrated by showing how the people from Dayton, while not having all the time in their lives, live richer, fuller lives than those who have all the time on their hands in New Greenwich.

Fear of death and danger

Negligibly senescent beings have developed a stronger fear of death and of danger than those who do not have time. This increases their boredom by reinforcing their inactivity. One of the characters asks, "Do I really want to spend my whole life trying not to die by mistake?" (Niccol 2011). She complains that, "The clock is good for no one. The poor die and the rich don't live. We can all live forever as long as we don't do anything foolish. Doesn't that scare you? That maybe you'll never do anything foolish or courageous or anything worth a damn" (Niccol 2011).

De Grey mentions that if we were to have access to radical life-extension, we would not need to be in a hurry anymore.[5] "So, some things that currently seem safe to us will come to seem too dangerous. Some things that currently seem too dangerous will become significantly safer" (Agar 2010). This paralyzing fear of danger and of not dying by mistake or accident would also lead negligibly senescent beings to retreat from the world.

Retreat from the world

Agar predicts that "negligibly senescent people will retreat from the world," (Agar 2010) and that "there's also a good chance that negligibly senescent people may have rather restricted contact with others" (Agar 2010). Similarly, in *In Time*, the negligibly senescent beings live in their own protected time zone. They have retreated from the rest of the world. Their relationship with one another is also tremendously more distant than those who live in Dayton. Will and his mother are portrayed as very close to each other, while the relationship between individuals of New Greenwich are portrayed as quite more distant and cold. This is one respect in which radical life extension undermines the meaning in their lives.

Conclusion

In the book *Bioethics at the Movies*, editor Sandra Shapshay asks in the introduction whether some films do indeed philosophize and mentions that movies and narratives can be used in three different ways to advance bioethical reflection:

> "(1) pedagogically, as providing useful, compelling, and even 'cool' illustrations of bioethical issues for students; (2) interpretatively, as providing fleshed-out interpretations of independently made bioethical claims, and (3) experimentally, as providing rich thought-

> experiments that tap into moral intuitions and advance ethical thinking." (Shapshay 2009)

The movie *In Time* can be used instructively in all three ways. It is not only an illustration of the debate regarding radical life-extension, elucidating many ethical challenges with radical life-extension. It also brings forward some arguments that have not appeared to our knowledge in the scientific literature. In addition, it raises the prospect that radical life-extension might be boring, not because people will not have new experiences, but because they might look and behave the same for the rest of their lives. While in the debate, staying young is often used as an argument in favour of life-extension, in the movie, it is presented as something that might not be desirable and something look forward to. While the strength of this argument is questionable, it suffices to say here, for the sake of our investigation that it is appealing, because it brings some new light into the bioethical debate. This, of course, does not mean that all movies philosophize. But some do, and *In Time* is a good example of this. In light of the philosophical issues raised by the film, we can learn more by exploring other work of screen writer Andrew Niccol, who often brings an interesting critical voice regarding the ethics of new (medical) technologies.

Footnotes

1. See http://scifimedhums.glasgow.ac.uk/journal-issue/ accessed Feb 08, 2017.
2. For an overview of the debate on the ethics of human enhancement, see Juengst and Moseley (2016).
3. For argument concerning safety, see Glannon (2002a, b).
4. Interview with Aubrey de Grey, http://www.speculist.com/archives/000065.html, Accessed Feb 13, 2016.
5. Interview with Aubrey de Grey, http://www.speculist.com/archives/000065.html, Accessed Feb 08, 2017.

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